



# MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

FIRST YEAR SEMESTER ONE EXAMINATION FOR

DIPLOMA IN MECHANICAL ENGINEERING

PLANT AND PRODUCTION

ENGINEERING DRAWING 1

DATE: 1/12/2021

TIME: 8.30-2.30 PM

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## INSTRUCTIONS: ANSWER ALL QUESTIONS

Attempt all the questions

1.
  - a) With the aid of a sketch, state five items included in a title block (5 marks)
  - b) Using the uppercase and lowercase letters, print letters A-Z and numbers 0-9 (10 marks)
  - c) Illustrate a method of dividing a straight line measuring 100mm into a ratio of 3:4:5 (5 marks)
2.
  - a) Construct an external tangent to two unequal circles diameter 40 mm and 70mm with centers O, O<sub>1</sub> 125mm apart respectively. (10 marks)
  - b) Construct the following angles.
    - i. 127.5°
    - ii. 105°
    - iii. 15° (6 marks)

- c) Sketch the following types of lines and highlight two uses of each
- i. Border line
  - ii. Construction line
  - iii. Hidden line
  - iv. Centre line (4 marks)
3. a) Construct a tangent to a point P 110 mm away from the center of a circle diameter 50mm. (10 marks)
- b) Construct a heptagon given the diameter of a circle 70 mm. (10 marks)
4. a) Construct an internal tangent to two unequal circles radii  $R_1=25$  mm and  $R_2=40$  mm with centre distance between the circles= 80 mm. (10 marks)
- b) Use concentric circles method to draw an ellipse with the following dimensions
- Major diameter = 100mm
  - Minor diameter = 60mm
  - The ellipse should lie vertically (10 marks)
5. a) Draw an involute to a given circle of diameter 50 mm (10 marks)
- b) Construct two curves blending two circles given the following specifications.
- i.  $R_1= 20$ mm
  - ii.  $R_2= 35$ mm
- c) Distance between center = 100mm (10 marks)